

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Atty. Docket

HERFRIED K. WIECZOREK

DE 000208

Serial No.

Group Art Unit

Filed: CONCURRENTLY

Ex.

Title: X-RAY DETECTOR MODULE

Commissioner for Patents  
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Prior to calculation of the filing fee and examination, please amend the above-identified application as follows:

IN THE CLAIMS

Please amend the claims as follows:

3. (amended) An X-ray detector module, notably as claimed in claim 1, which includes a carrier (3) that forms cells (4) arranged in the form of a grid and is made of a material that is essentially non-transparent to X-rays, wherein a mass of scintillator particles (6) that are embedded in a binder (7) and emit light in the range of a longer wavelength  $\lambda$  in response to the absorption of X-rays is provided in the cells (4), and wherein the scintillator particles

(6) have a grain size of less than 200 nm and preferably less than 100 nm.

4. (amended) An X-ray detector module as claimed in at claim 1, characterized in that the carrier (3) consists of a metal, of a synthetic material that is filled with a metal and/or of glass that can be photostructured.

5. (amended) An X-ray detector module as claimed in claim 1, characterized in that the surface of the carrier (3) is provided at least partly with a reflector layer (2) which has a degree of reflection of more than 90% for the light in the range of the wavelength  $\lambda$ .

6. (amended) An X-ray detector module as claimed in claim 1, characterized in that the volume of the scintillator particles (6) amounts to from 50% to 70% of the volume of the mass that is provided in the cells (4).

7. (amended) An X-ray detector module as claimed in claim 1, characterized in that the height (h) of the mass embedded in the cells (4) amounts to from 0.1 mm to 5 mm.

8. (amended) An X-ray detector module as claimed in claim 1,

characterized in that the width (b) as measured in the plane of the array of the cells (4) is smaller than the height (h) of the cells.

9. (amended) An X-ray detector module as claimed in claim 1, characterized in that the scintillator particles (6) contain rare earth oxide or oxisulphides with Pr, Ce, Tb and/or Eu as a doping material, notably  $\text{Gd}_2\text{O}_2\text{S}:\text{Pr}$  or  $\text{Gd}_2(\text{SO}_4)\text{O}:\text{Ce}$ , and/or alkali halides such as CsI:Tl, CsI:Na or NaI:Tl and/or  $\text{CdWO}_4$ .

10. (amended) An X-ray detector module as claimed in claim 1, characterized in that to one side of at least one cell (4) there is provided a detector (5) for converting photons from the range of the longer wavelength  $\lambda$  into an electrical signal.

11. (amended) An X-ray detector module as claimed notably in claim 1, which detector module includes a carrier (3, 3') that forms cells (4) arranged in the form of a grid and consists of a material that is essentially non-transparent to X-rays, wherein the cells (4) have a tubular shape and only a sub-volume of the cells contains a scintillator material (6, 7).

12. (amended) A method of manufacturing an X-ray detector module (1) as claimed in claim 1, where a free-flowing mixture of a binder

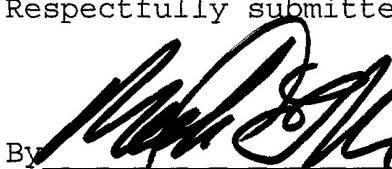
(7) and scintillator particles (6) is deposited at least once in the cells (4) of a carrier (3), after the mixture is densified by thermal treatment and/or by UV irradiation.

REMARKS

The foregoing amendments to the claims were made solely to avoid filing the claims in the multiple dependent form so as to avoid the additional filing fee.

The claims were not amended in order to address issues of patentability and Applicant respectfully reserves all rights he may have under the Doctrine of Equivalents. Applicant furthermore reserves his right to reintroduce subject matter deleted herein at a later time during the prosecution of this application or continuing applications.

Respectfully submitted,

By   
Michael E. Marion, Reg. 32,266  
Attorney  
(914) 333-9641

## APPENDIX

3. (amended) An X-ray detector module, notably as claimed in claim 1-~~or~~-2, which includes a carrier (3) that forms cells (4) arranged in the form of a grid and is made of a material that is essentially non-transparent to X-rays, wherein a mass of scintillator particles (6) that are embedded in a binder (7) and emit light in the range of a longer wavelength  $\lambda$  in response to the absorption of X-rays is provided in the cells (4), and wherein the scintillator particles (6) have a grain size of less than 200 nm and preferably less than 100 nm.

4. (amended) An X-ray detector module as claimed in at least one of the claims 1 to 3 claim 1,

characterized in that the carrier (3) consists of a metal, of a synthetic material that is filled with a metal and/or of glass that can be photostructured.

5. (amended) An X-ray detector module as claimed in at least one of the claims 1 to 4 claim 1,

characterized in that the surface of the carrier (3) is provided at least partly with a reflector layer (2) which has a degree of reflection of more than 90% for the light in the range of the wavelength  $\lambda$ .

6. (amended) An X-ray detector module as claimed in at least one of the claims 1 to 5claim 1,

characterized in that the volume of the scintillator particles (6) amounts to from 50% to 70% of the volume of the mass that is provided in the cells (4).

7. (amended) An X-ray detector module as claimed in at least one of the claims 1 to 6claim 1,

characterized in that the height (h) of the mass embedded in the cells (4) amounts to from 0.1 mm to 5 mm.

8. (amended) An X-ray detector module as claimed in at least one of the claims 1 to 7claim 1,

characterized in that the width (b) as measured in the plane of the array of the cells (4) is smaller than the height (h) of the cells.

9. (amended) An X-ray detector module as claimed in at least one of the claims 1 to 8claim 1,

characterized in that the scintillator particles (6) contain rare earth oxide or oxisulphides with Pr, Ce, Tb and/or Eu as a doping material, notably  $\text{Gd}_2\text{O}_2\text{S:Pr}$  or  $\text{Gd}_2(\text{SO}_4)\text{O:Ce}$ , and/or alkali halides such as CsI:Tl, CsI:Na or NaI:Tl and/or CdWO<sub>4</sub>.

10. (amended) An X-ray detector module as claimed in at least one of the claims 1 to 9claim 1,

characterized in that to one side of at least one cell (4) there is provided a detector (5) for converting photons from the range of the longer wavelength  $\lambda$  into an electrical signal.

11. (amended) An X-ray detector module as claimed notably in one of the claims 1 to 10claim 1,

which detector module includes a carrier (3, 3') that forms cells (4) arranged in the form of a grid and consists of a material that is essentially non-transparent to X-rays, wherein the cells (4) have a tubular shape and only a sub-volume of the cells contains a scintillator material (6, 7).

12. (amended) A method of manufacturing an X-ray detector module (1) as claimed in at least one of the claims 1 to 11claim 1, where a free-flowing mixture of a binder (7) and scintillator particles (6) is deposited at least once in the cells (4) of a carrier (3), after the mixture is densified by thermal treatment and/or by UV irradiation.